(No Model.) 3 Sheets—Sheet 1.

F. STANTON.

GRAIN REGISTER.

No. 373,805. Fig. 1. Patented Nov. 22, 1887.

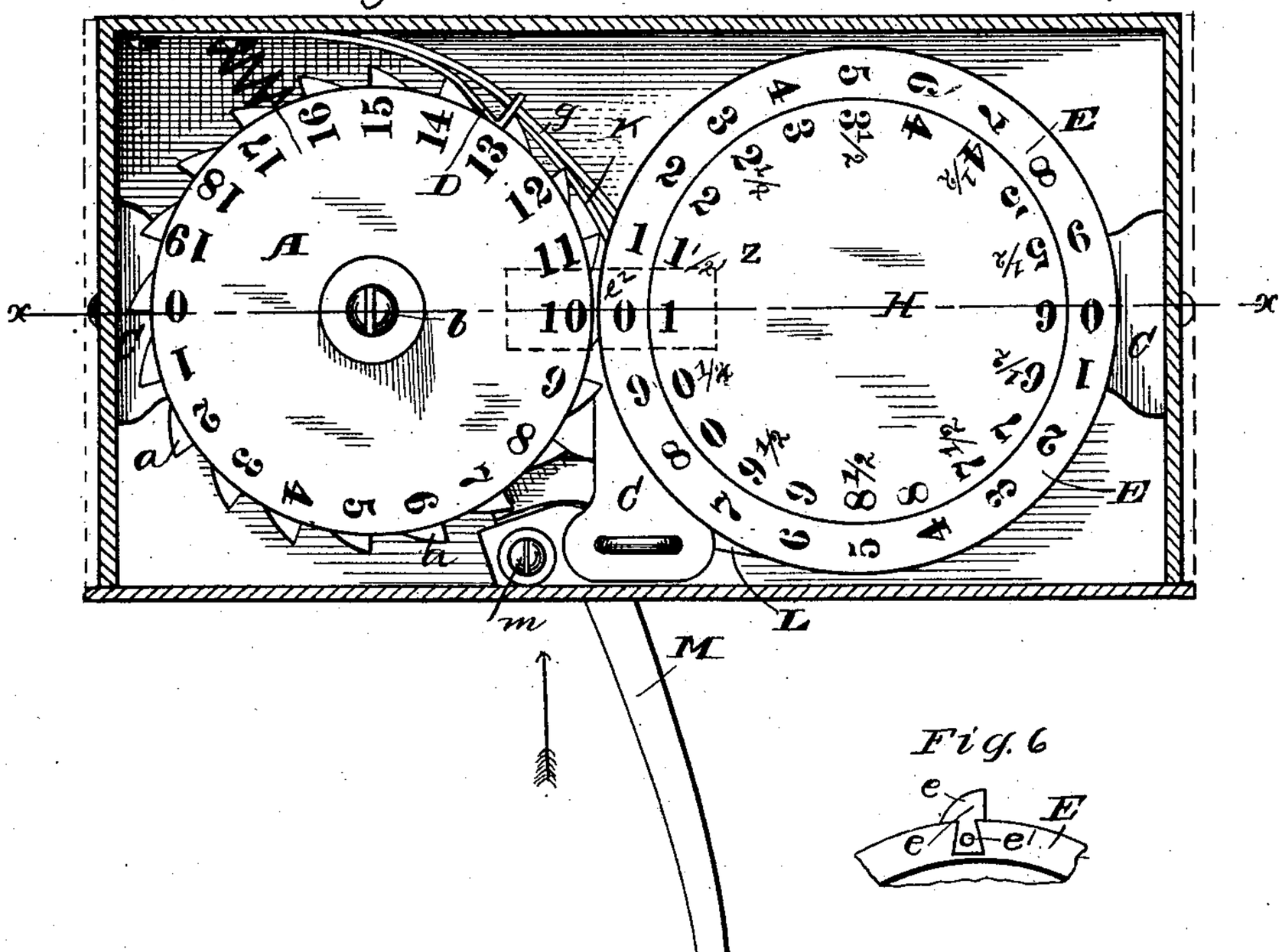
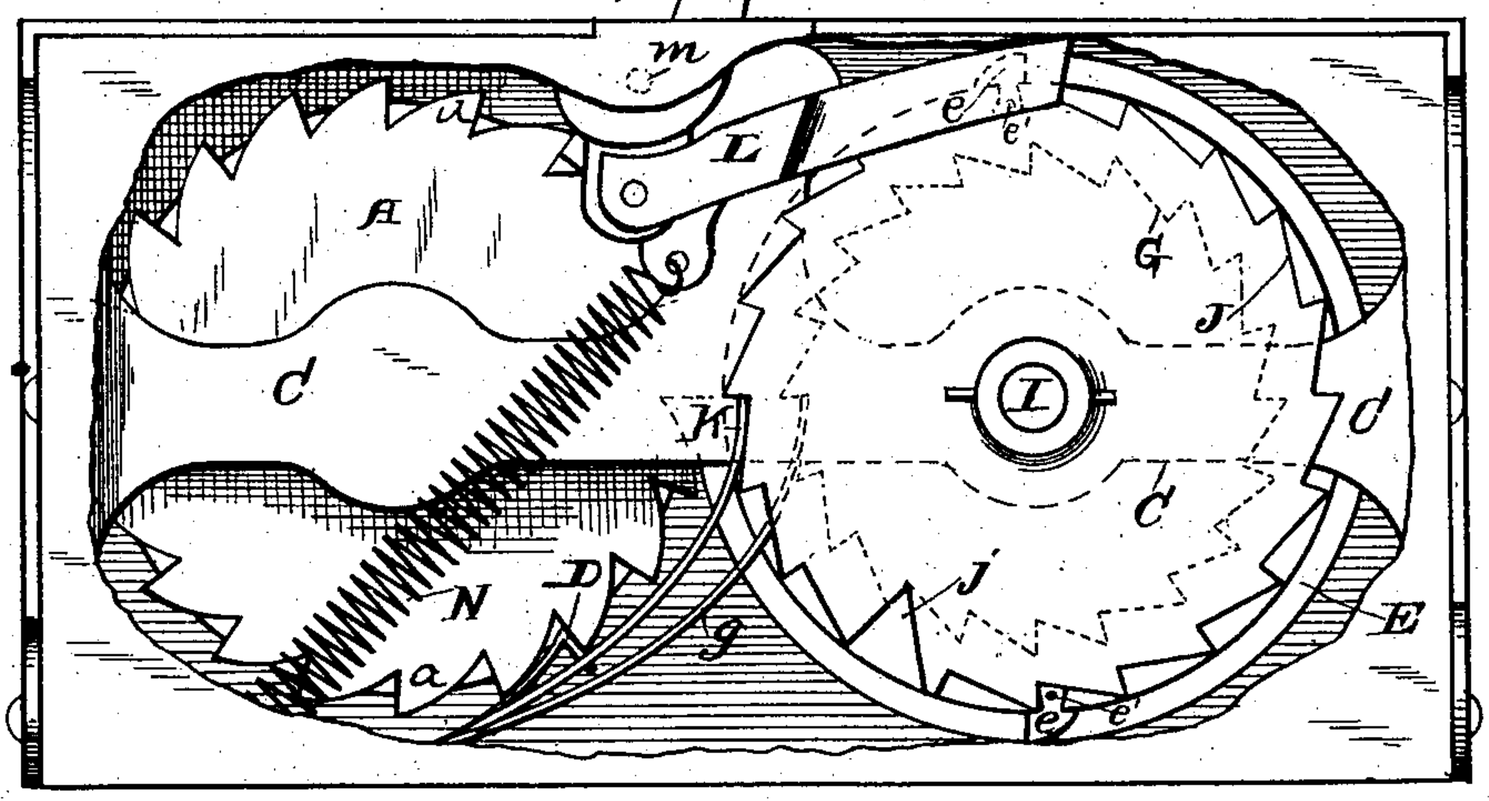


Fig. 6

M Fig. 2



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(No Model.) 3 Sheets—Sheet 2.

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GRAIN REGISTER.

No. 373,805. Patented Nov. 22, 1887.

Fig. 3

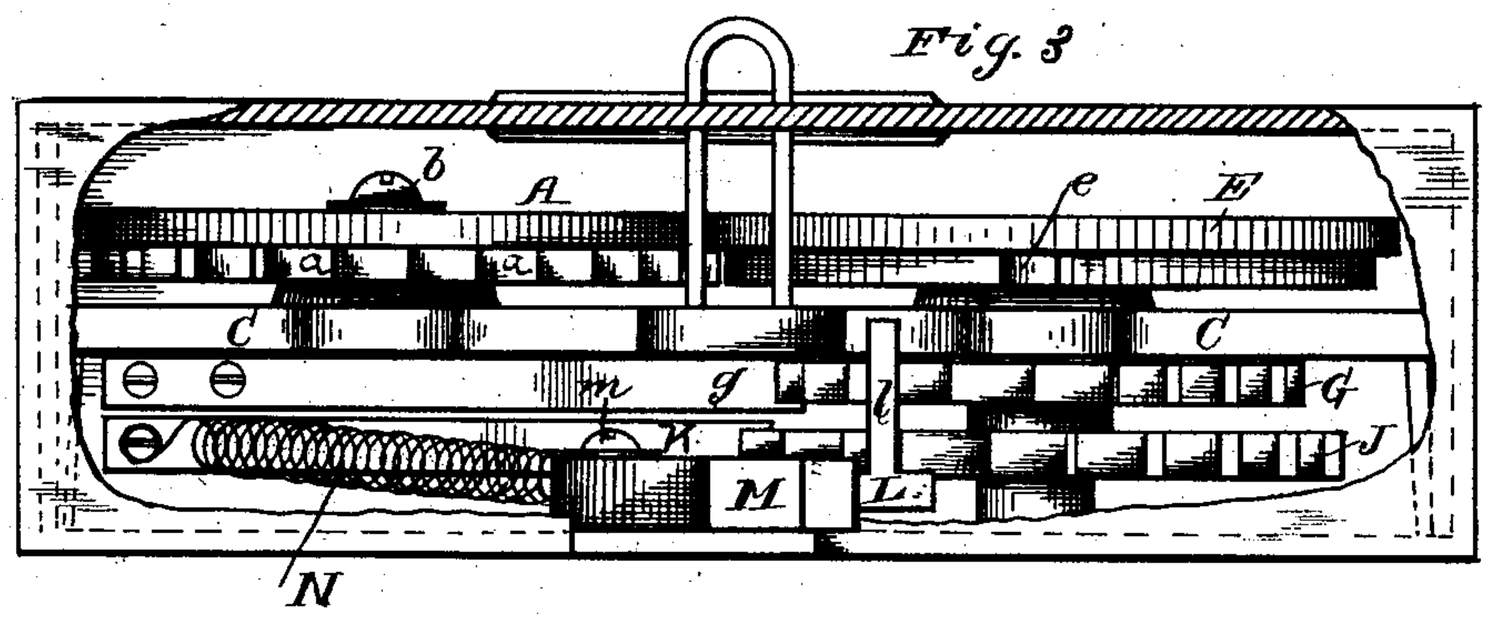


Fig. 4

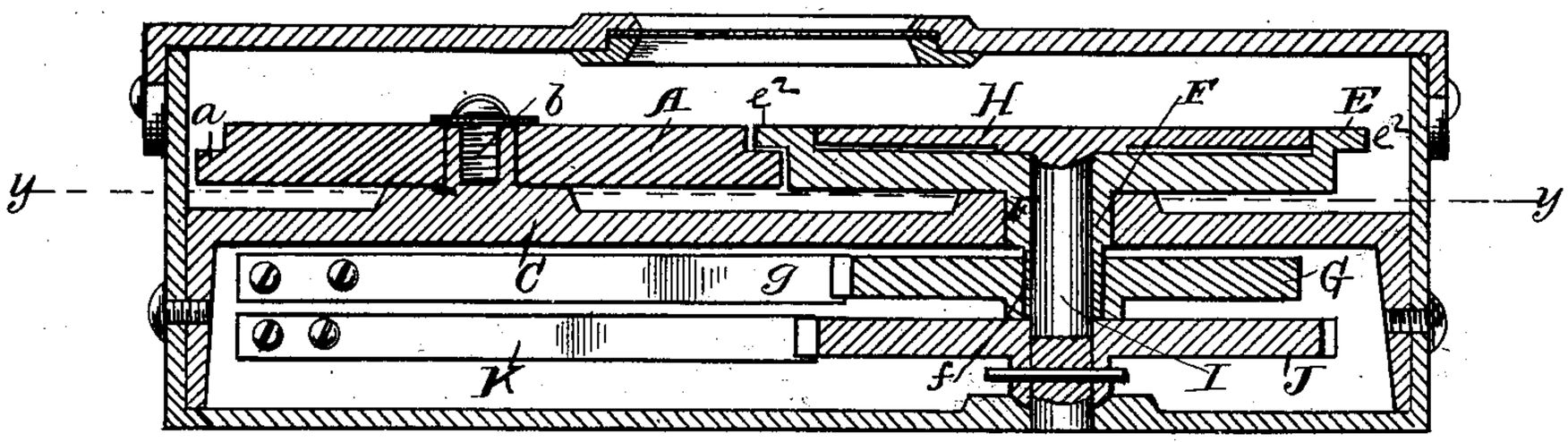
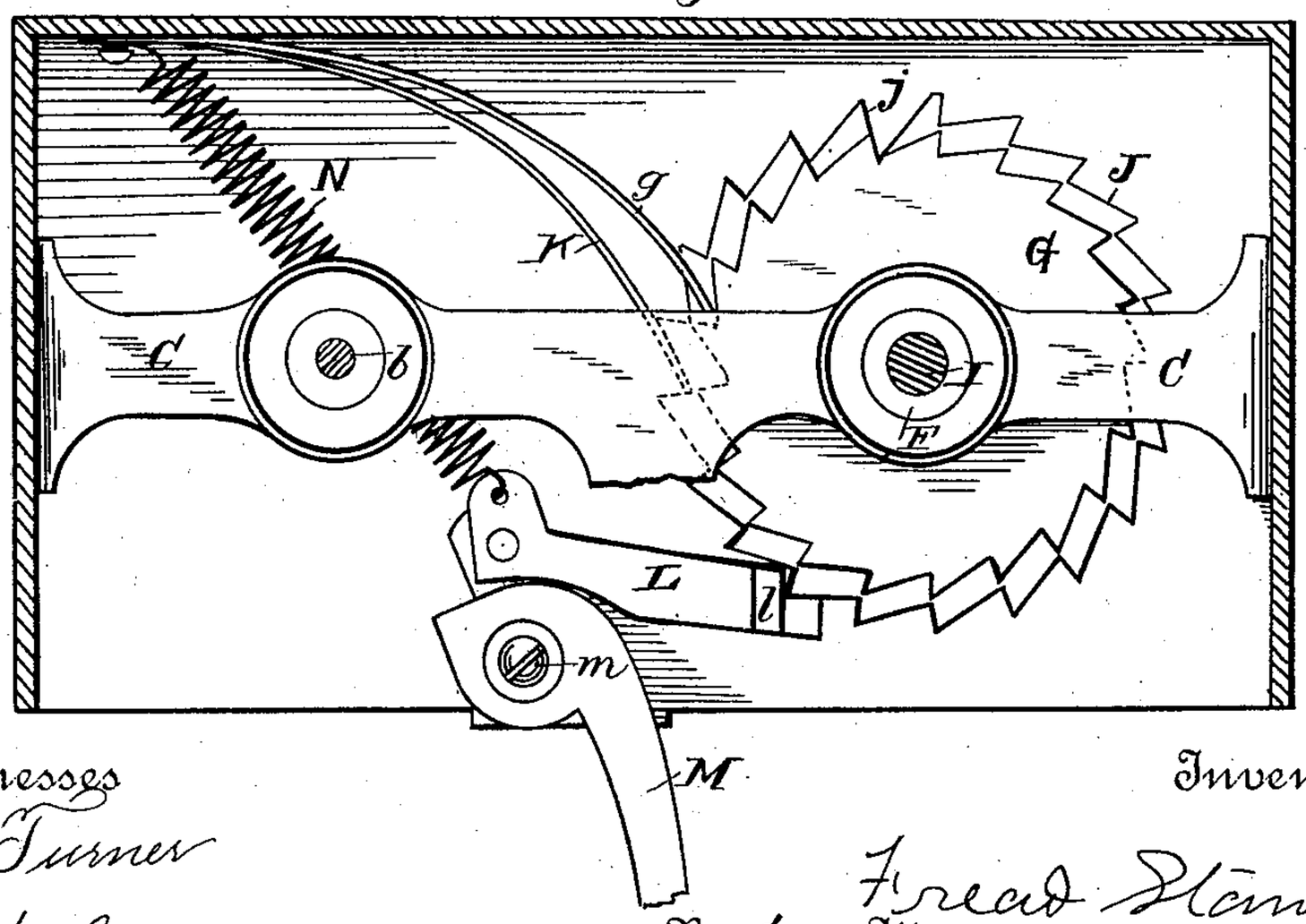


Fig. 5



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(No Model.) 3 Sheets—Sheet 3

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GRAIN REGISTER.

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Fig. 7

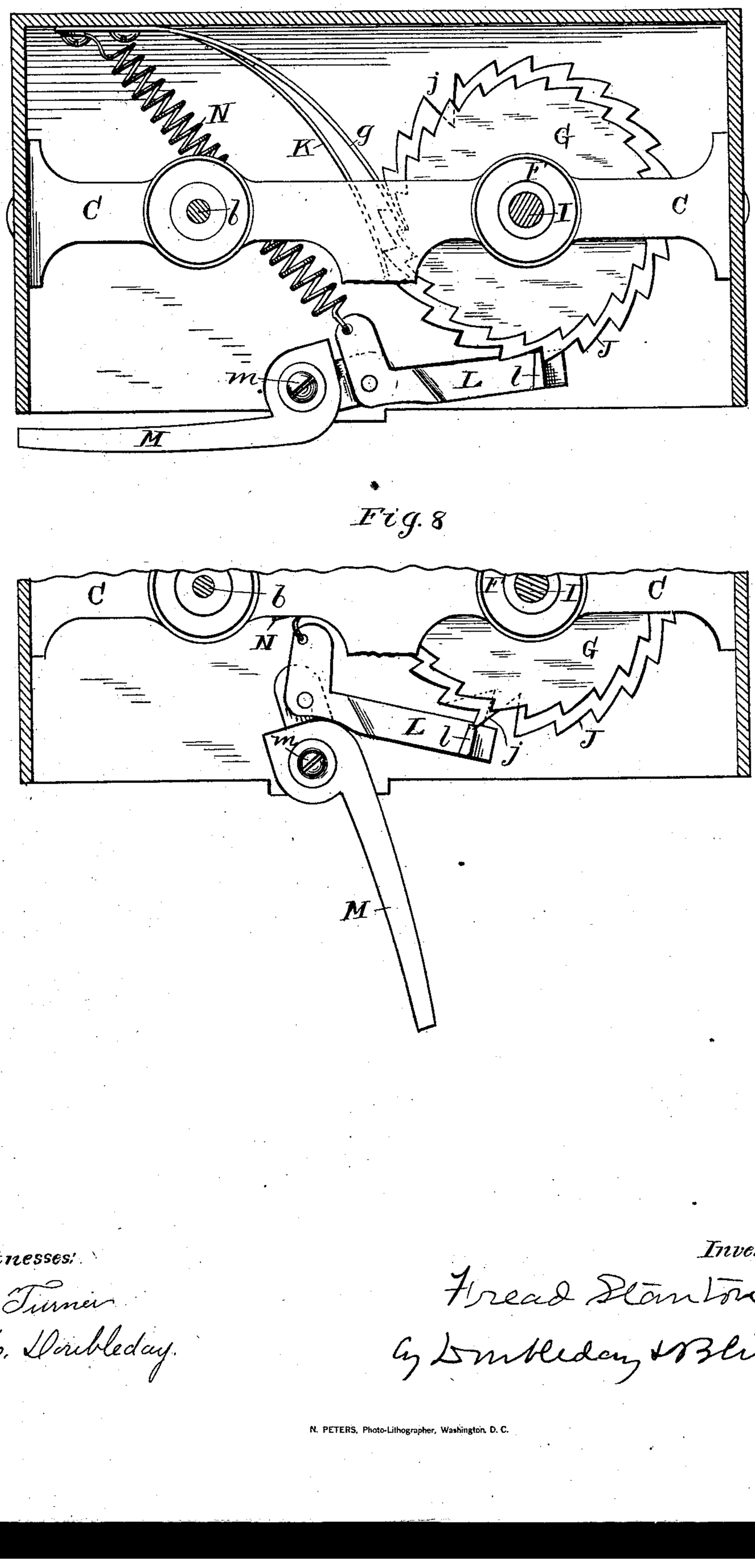

Fig. 8

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UNITED STATES PATENT OFFICE.

FREAD STANTON, OF STILLWATER, MINNESOTA, ASSIGNOR TO E. S. BROWN, RECEIVER OF THE NORTH-WESTERN MANUFACTURING AND CAR COMPANY, OF SAME PLACE.

GRAIN-REGISTER.

SPECIFICATION forming part of Letters Patent No. 373,805, dated November 22, 1887.

Application filed June 5, 1886. Serial No. 204,249. (No model.)

To all whom it may concern:

Be it known that I, FREAD STANTON, a citizen of the United States, residing at Stillwater, in the county of Washington and State of Minnesota, have invented certain new and useful Improvements in Grain-Registers, of which the following is a specification, reference being had therein to the accompanying drawings.

Figure 1 is a front view. Fig. 2 is a rear view. Fig. 3 is an edge view looking in the direction of the arrow, Fig. 1. Fig. 4 is a vertical section on line *x x*, Fig. 1. Fig. 5 is a section on line *y y*, Fig. 4, the casing having been broken away in all the figures. Fig. 6 is a detached view enlarged. Figs. 7 and 8 are detail views showing some of the parts in different positions.

The invention relates to that class of registering mechanism in which part of the dial or figure-carriers are arranged in concentric relation.

In Figs. 1 to 5 the parts are shown in the position which they ordinarily occupy preparatory to the actuating-lever being moved in its forward stroke—that is to say, the pawl is in contact with the radial face of one of the ratchet-teeth of the units-wheel and the ends of the detents are in contact with the radial faces of their respective ratchet-teeth, the figures seen through the opening in the casing being in line with each other; and in this specification whenever I apply the words "normal position" to the ratchet-wheels I mean that their radial faces shall be in contact with their respective pawls, and when I apply the same words to the lever I mean the position in which it is shown in Figs. 1, 2, 5, that being the limit of its rearward movement.

This register is provided with a projecting lever, which, when in use, is ordinarily arranged at such distance from a post or other stop or fender that it is impossible to pass a grain-receptacle—such as, for instance, a half-bushel—between the post and the casing of the register without its engaging with the lever and moving it far enough to actuate the operating parts.

In this class of registers it is desirable that they should be so constructed that while it is impossible to thus pass a half-bushel between the casing and the post or fender without moving the lever far enough to register 1, yet the lever may be moved some distance farther in the same direction without registering 2, in order to provide for somewhat varying sizes of half-bushels.

A is the hundreds-wheel, having figures and numbers from 0 to 19 arranged in a circle upon its flat face, and having a series of ratchet-teeth, *a a*, projecting from its periphery. This hundreds-wheel is mounted on a pivot or stud, *b*, supported in a girt or cross-bar, C.

D is a detent or stop, arranged with its free end to take into the ratchet-teeth, and thus prevent improper rotation of the wheel.

E F is the tens-wheel, having two sets of figures from 0 to 9 arranged in a circle upon its flat side, and having also a hollow trunnion or sleeve-bearing, F, which is mounted to rotate in the girt C. The front face of this wheel is recessed to receive the units-wheel, as will be explained. This tens-wheel carries two diametrically-opposite spurs or lugs, *e e*, arranged between the 9 and 0, to engage with the teeth of the hundreds-wheel and advance said hundreds-wheel one number at each half-rotation of the tens-wheel. The sleeve F has upon one side a flattened portion or key-seat, *f*.

G is a ratchet-wheel mounted upon the rear end of the sleeve F, and *g* is a detent engaging with the ratchet-wheel G.

H is the units-wheel, having upon its flat face a series of numbers adapted to register half-bushels from one-half to nine and one-half. This wheel is provided with a spindle or short shaft, I, which is mounted in the sleeve F, the thickness of the wheel being about equal to the depth of the recess in the tens-wheel, so that the figured faces of all three wheels are in a common plane close to the front wall of the box or inclosing-casing, which has a slot or opening (indicated by the dotted lines at Z, Fig. 1) through which to read the figures as they are successively advanced to the opening.

J is a ratchet-wheel keyed to spindle I, so that this ratchet-wheel and the units-wheel H shall revolve in unison. The ratchet-wheel J is of greater diameter than the ratchet-wheel

G, and has all of its notches of uniform depth except one. (See Figs. 2, 5, and 8, at *j*.)

K is a detent engaging with the ratchet-wheel J.

L*l* is a pawl pivoted to lever M, which in turn is mounted upon the pivot *m*. This pawl engages continuously with the ratchet-wheel J, and whenever it enters the deep notch *j* it also engages with the ratchet-wheel G. When the pawl is in engagement with the other notches of ratchet-wheel J, it rides over the teeth of ratchet-wheel G without actuating the tens-wheel.

As the grain receptacle usually employed in connection with this kind of register contains half a bushel, it is obvious that it is desirable to provide the units-wheel with twenty notches, of which nineteen are so shallow that when the pawl engages with each of them it will be kept out of contact with the teeth of the tens-wheel, but will advance that wheel one number whenever twenty half-bushels have been successively registered. It will be seen that the units-wheel is properly figured to indicate such indicating of half-bushels.

N is the returning-spring, to pull the pawl back to its normal position after it has moved the units-wheel or the units and tens wheels.

From an examination of the drawings and the above description it will be seen that the units-wheel will at each stroke of the lever register a half-bushel, and that after nine and a half bushels have been registered the next stroke of the lever will advance the tens-wheel one notch and number. At each half-revolution of the tens-wheel it will advance the hundreds-wheel one notch and number up to 19. It will be seen (see Fig. 6) that the inner ends or heel ends of the spurs or lugs *e e* are dovetailed, and are seated in the correspondingly-shaped recesses formed for their reception in the tens-wheel immediately behind the flange e^2, which carries the figures, the lugs being preferably further secured to the wheel by means of rivets *e' e'*. This flange e^2 overlaps the ratchet-teeth *a a* of the hundreds-wheel, and by reason of such construction and of the tens-wheel being recessed upon its outer face to receive the units-wheel the figure-bearing faces of these three wheels are in a common plane, so that the figures all move in close proximity to the outer wall of the casing, which has the slot in it indicated by the dotted lines at Z in Fig. 1. Of course the wheel E F might be made in somewhat different form from that shown. For instance, it might be flat upon its figured face instead of recessed, with the units-wheel arranged to run in close proximity to such flat face; or the tens-wheel might consist of a rim or flange to carry the figures and be connected with the sleeve by means of arms or spokes, although in practice I prefer the construction shown. So, also, other modifications in details might be made without departing from the spirit of my invention.

It is well known that this class of grain-registers is adapted for use in registering grain contained in half-bushels, and that when so used the lever M is actuated by pushing a half-bushel against it, the half-bushel being thrust between the casing of the register and a wall, post, or other fixed thing placed in such positions that a half-bushel cannot be passed between the register and such post without moving the lever a sufficient distance to advance the units-wheel; but owing to differences in the sizes of the half-bushels and other circumstances there is variation in the distance which the lever is thus moved; hence it is desirable to so construct the register that such variations in the travel of the lever may occur without in any manner interfering with a proper advancing of the dials.

By an examination of Figs. 5, 7, and 8 it will be seen that while it is not necessary to move the lever from the position shown in Fig. 5 to that shown in Fig. 7 in order to advance the units-wheel one notch, yet the lever may be pushed to the extreme limit of its throw without doing any harm. This capability of the register is due in part to the fact that the detent K bears upon the point of the tooth below it when the wheel is being advanced, and consequently it (the detent) tends to return the units-wheel from the position shown in Fig. 7 to that shown in Fig. 5 whenever the lever may have advanced said wheel to the position shown in Fig. 7. Again, the pressure of the pawl L upon the periphery of the units-wheel and the tens-wheel when both wheels are being moved tends to move those wheels backward in case they have been advanced too far by reason of the lever having been moved into the position shown in Fig. 7. Thus the single spring N tends not only to withdraw the pawl L and lever M to their normal position, but also tends to move the units-wheel or the units and tens wheels backward in case they have been advanced too far. The importance of thus returning the ratchet-wheels to the position shown in Fig. 5 is illustrated in Fig. 8, where it will be seen that in case the ratchet of the units-wheel were not thus moved backward after being advanced too far, the parts being left as indicated in Fig. 8, the pawl would not drop far enough into the notch *j* to insure its taking hold of the ratchet G of the tens-wheel, and hence there would be liability of making an extra revolution of the units-wheel, and thus missing count, it being apparent that the pawl might be moved forward much farther than would be required to advance the units-wheel one number without moving the tens-wheel, and that the pawl would rest in one of the shallow notches of the units-wheel at each of its next vibrations. Again, in my register both the units and tens wheels can be thus advanced farther than is necessary and afterward returned part way without disarranging the relationship between the tens-wheel and the hundreds-wheels, this being due to the fact that the spurs *e e* pass out of engagement

with the ratchet-teeth *a* of the hundreds-wheel as soon as said spurs have successively advanced the hundred-wheel one step, so that an unusual forward movement of the tens-wheel and its immediate return may occur without advancing the hundreds-wheel more than one number.

Although in practice the tens-wheel will be returned to its normal position when it has been advanced too far, yet such returning movement will not ordinarily be found essential, because the pawl when it enters the deep notch of the units-wheel ratchet will at its next forward impulse advance the tens-wheel.

One marked advantage which is due to the tens-wheel being made with a projecting flange, e^2, and the hundreds-wheel being made with its ratchet-teeth *a* projecting beyond the solid part which carries the figures is this: The tens and hundreds figures can be arranged in a common plane and close to each other, and at the same time the projecting flange of the tens-wheel hides the ratchet-teeth of the hundreds-wheel, so that they are not seen through the opening which is provided for inspecting the figures.

One advantage which results from my method of mounting the units-wheel upon a shaft, I, which projects through and beyond the sleeve of the tens-wheel is this: I am enabled to advance all of my wheels by a positively-acting step-by-step advancing mechanism, and can also positively lock the wheels against being moved backward beyond their normal positions through the use of detents which engage with the radial faces of the ratchet-wheels.

By an examination of Fig. 7 it will be seen that the relation of the pivot *m* of the lever M and the pivot which connects the pawl L to the lever is such that these pivots and the working end of the pawl are about in line with each other when the units ratchet-wheel has been advanced one tooth, so that the lever can be moved over into the position shown in Fig. 7 with but slight additional forward movement of such ratchet-wheel. This is desirable in order to provide for the variations in throw of the lever without danger of the units ratchet-wheel not being returned to its normal position when the lever is returned to its normal position.

What I claim is—

1. In a registering-machine, the combination of the hundreds-wheel provided with the ratchet teeth *a*, projecting from said wheel below the face which bears the numbers, the tens-wheel provided with the projecting flange e^2, the spurs below the flange, and the recess upon its upper face, and the units-wheel arranged in the recess, substantially as set forth.

2. In a registering-machine, the combination of the hundreds-wheel provided with ratchet-teeth, the tens-wheel provided with spurs engaging with the ratchet-teeth of the hundreds-wheel, the ratchet-wheel G, attached to the tens-wheel, the units-wheel of less diameter than the tens-wheel, the ratchet-wheel J, of greater diameter than the ratchet-wheel G, attached to the units-wheel, the pawl engaging with both the ratchet-wheels G J, and the detents engaging with the ratchet-wheels G J, substantially as set forth.

3. In a registering-machine, the combination, with the tens-wheel provided with the sleeve F and the ratchet-wheel on the end of the sleeve, of the units-wheel provided with the spindle I, seated in the sleeve, the ratchet-wheel J on the end of the spindle, the pawl engaging with the ratchet-wheels, the lever M, and the detent K, adapted to move the units ratchet-wheel backward, substantially as set forth.

4. In a registering-machine, the combination, with the tens-wheel and the units ratchet-wheel having notches of different depths, of the lever, the pawl, the spring N, adapted to move the lever and pawl and the ratchet-wheel J backward, and a detent engaging with the ratchet-wheel J to prevent its being moved beyond its normal position, substantially as set forth.

5. In a registering-machine, the combination, with the units-wheel and its ratchet-wheel, the tens-wheel and its ratchet-wheel, the units ratchet-wheel having notches of different depths, of the lever and the pawl having their pivots arranged substantially as described, whereby after the lever has been moved a sufficient distance to advance the units-wheel one number the lever may be farther moved in the same direction without materially advancing the units-wheel, substantially as set forth.

6. In a registering-machine, the combination of the hundreds-wheel, the tens-wheel carrying the ratchet-wheel G, and the units-wheel arranged upon one side of the tens-wheel and its ratchet-wheel G, and provided with the spindle carrying the ratchet-wheel J on the opposite side of the tens-wheel and its ratchet-wheel G, substantially as set forth.

7. In a registering-machine, the combination, with the recessed tens-wheel provided with the sleeve F, and the ratchet-wheel G on the end of the sleeve, of the units-wheel H, provided with the spindle I, seated in the sleeve, the ratchet-wheel J on the end of the spindle, and a bearing between the tens-wheel and the ratchet-wheel G, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

FREAD STANTON.

Witnesses:
W. S. GOODHUE,
C. R. MIMS.